HOFMANN
USA

GEODYNA 40 / 40 Limited Edition / 60 / 80 Series

WHEEL BALANCER
SERVICE MANUAL SET

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Quick guide for Error and C-Functions

Errors:	Page:	Functions:		Page:	Codes available starting in version number
E0	10	C0C		07+30	1.2 Deleted after 1.60
E1	10	C1C		03	1.2
E2	10	C2C		03	1.2
E3	10	C3C		03	1.2
E4	10	C4C		03+09+20+40	1.2
E5	10	C5C		03	1.2
E6	10	C8C		04	1.2
E7	10	C9C		04	1.2
E8	11	C10C		03+04+41	1.2
E9	11	C11C		04	1.3
E15	11	C12C		04	1.2
E30	11	C13C		04	1.2
E31	11+47	C14C		08+42	1.2
E34	12	C15C		04+09	1.60
E35	12	C17C		04	1.5
E36	12	C18C		08+37	1.5
E50	13	C19C		08+38	1.5
E51	13	C20C	*	05+08+40	1.61
E52	13	C24C	*	05+30	1.2
E53	13	C43C	*	06	1.2
E54	13	C46C		07+30	1.2 Deleted after 1.60
E55	13	C47C		07+30+31	1.2
E56	13	C50C		09+22	1.3
E58	13	C51C		09+22	1.3
E60	13	C52C		09+22	1.5
E61	13	C53C		09+23	1.2
E62	13	C54C		09+23	1.2
E63	13	C55C		09+24	1.2
E64	14	C59C		09+24	1.2
E65	14	C60C		09+24	1.2
E70	14	C61C		09+25	1.2
E71	14	C62C		09	1.2
E72	15	C63C		09+26	1.2
E73	15	C64C		09	1.2
E74	15+47	C65C		09+26	1.2
E76	16	C66C		09	1.2
E77	16	C68C		09+26	1.2
E78	16	C69C		09+26	1.2
E79	16	C74C		09+27	1.2
E80	16	C75C		09+28	1.2
E136	16	C80C		08+32+33	1.2
		C81C		08+34	1.3
		C82C		08+36	1.5
		C83C		08+39	1.2
		C84C		08+40	1.2

*indicates code can only be accessed by unplugging the opto cable

SETTING FUNCTION CODES

Function codes are verified, selected, and changed as follows:
Enter a code by pressing C - the code number - then C again. The right display will show one of the numbers that follows the codes below. After verifying or changing the code press the RED (stop) button.

Unless stored in the computer memory (located on the Interface circuit board) a function code that has been changed returns to the original state when the power is turned off.

To store code settings in the computer memory:

Enter **C 1 0 C**. Then press keys **1 & 3** at the same time.
The Processor circuit board issues three tones signaling the code setting has been stored in the memory.

C1: Readout resolution (round-off) - Press the ● (decimal) button to change.
1 = 0.05 Ounce / 1 Gram
0 = 0.25 Ounce / 5 Gram Factory set to 0

C2: Readout suppression of small imbalances, as selected using C9 or C8.
Press the ● button to turn on or off.
1 = On Factory set to 1
0 = Off

If the readout is set to read in ounces, the suppression value used is from C9.
If the readout is set to read in grams, the suppression value used is from C8.

C3: Readout in ounces or grams - Press the ● button to change.
1 = Ounces Factory set to 1
0 = Grams

C4: Electronic compensation of the residual imbalance. Enter C 4 C then press the Start button to go through a cycle. Press the stop button to continue. Compensation cannot be stored in the computer memory and retained when power is off. It resets to 0 whenever power is turned off.
1 = On
0 = Off

C5: Machine brakes or coasts when the wheel guard is lifted.
Press the ● button to change.
1 = Brakes Factory set to 1
0 = Coasts

SETTING FUNCTION CODES
(cont.)

C8: Selection and entry in grams of the readout suppression of small imbalances. Factory set to 3.5 grams. All imbalance of the selected weight or less will display 0 grams. To enter a new value enter C8C, key in the new value, press the C button.

C9: Selection and entry in ounces of the readout suppression of small imbalances. Factory set to 0.25 ounce. All imbalance of the selected weight or less will display 0.00 ounces. To enter a new value enter C9C, key in the new value, press the C button.

C10: Stores selected codes data and adjustments into the computer memory located on the Interface circuit board.
Enter C 10 C then press buttons 1 & 3 at the same time.
Listen for a 3 tone audible acknowledgment.

C11: Selects index (position) brake operation. Press the ● button to turn on and off. Does not apply to Geodyna 40
1 = Shaft stops at the wheel weight position as the tire is rotated.
0 = Shaft does not stop at the wheel weight position

C12: Total balancing cycles. Entry of this code displays the total number of measuring runs the balancer has operated. The maximum count is 999,999. See Code C43C to Reset Counter.

C13: Selects operation by start button or wheel guard. Press the ● button to change.
1 = Machine starts as the wheel guard is closed or
when the start button is pushed.
0 = Machine starts only when the start button is pushed.

C15: Led Light Show. Press the ● button to change.
0 = disabled
1 = enabled after 5 minutes of non-use
2 = test (always on)

C17: Only from Eprom program version 1.51 and above. With this function you can select 5 through 10 revolutions for a measuring run. Factory set to 10 revolutions. If the PRO-MATCH program is in use, the measuring revolutions are automatically set to 10.
Press the ● button to change.

SETTING FUNCTION CODES
(cont.)

C20: ✻ Adjusts location imbalance. This code can only be accessed by unplugging the opto electronic unit. The default value is 20. To check location imbalance. Mount and balance a wheel to within 1 ounce. Then enter C 4 C. A 0 will show in the right display, C4. In the left. Press the START button. The balancer will run through a cycle, stop and display a 1 in the right hand display. Press the STOP button. Attach a weight to the outside of the wheel. Press the START button. After the wheel stops rotate it until only the center bar is on in the right hand display, the weight should be at 6:00. If the weight is not at 6:00 then it will need to be adjusted.

To Adjust:

Remove the screws from the display panel and for the 60/80 Series remove the display housing and weight tray. For the 60/80 Series reconnect display panel, and go through the procedure as described above To check location imbalance.

Unplug the opto electronic cable from the Interface board.
Enter C 20 C. Reconnect the opto electronic cable. A number will appear in the right hand display. If the weight is before 6:00 enter a number higher than the displayed (default) number, press the C button. If the weight is after 6:00 then enter a number lower than the displayed (default) number, press the C button. Press the START button and check to see if the location is correct, if not perform adjustment. After location is properly adjusted it must be stored in the permanent memory using the procedure for code C10C.

C24: ✻ Selects rim distance entry in millimeters (mm) or centimeters (cm) through the key panel. The machine is factory set for cm. Eprom version 1.61 now the code can only be accessed by unplugging the opto electronic

To check for the correct setting:

Enter code C 2 4 C
1 = distance entry must be made in cm - This is the correct setting
0 = distance entry must be made in mm - This is the incorrect setting

If 0 displays press the ● key to change to 1. Press the stop button.

To enter rim distance
in centimeters
(Correct Setting)

To enter rim distance
in millimeters
(Incorrect Setting)

SETTING FUNCTION CODES
(cont.)

C43: ✻ Resets the cycle counter. Built into the software of the balancer is a counter that records each time the balancer is operated. When code C12C is entered the total number of recorded measuring runs is displayed.

To reset the counter to zero:

Unplug the balancer from line voltage.
Remove the screws from the display panel and for the 60/80 Series remove the display housing and the weight tray.
For the 60/80 Series reconnect the display panel.
Unplug the Opto electronic cable from the connector on the Interface circuit board.
Connect the machine to power and turn machine on. Press Stop to delete E73.

Enter C 4 3 C.

Unplug the balancer from line voltage.
Reconnect the Opto electronic cable and reassemble the display panel (and for 60/80 Series reassemble weight tray).

Setup for Eprom versions 1.2 - 1.53

C46: Sets computer to North American or European standards as necessary to use code C0.
Press the ● or 0 button to change.
1 = North America
0 = Europe

Note: Always set C46 back to 0 after using C ● code otherwise the keyboard will be reversed.

C47: Sets the computer to operate in a specific balancer mode, either Geodyna 40, 60, 80 or 80.E
For version 1.51 to 1.53 the display will show:
GEO 40, or GEO 60, or GEO 80, or GEO 80.E
Press the ● key to change.

Note: For balancer modes in previous Eprom program versions refer to Program Updates.

C0: Sets the Function Codes to the factory recommendation if C46 is set to 1
To set press C ● C
(C46 must = 1)

C1 = 0 (.25 OZ Resolution)	C5 = 1 (Brakes w/wheel guard)
C2 = 1 (Suppression on)	C8 = 3.5 gr (Suppression value)
C3 = 1 (Displays ounces)	C9 = 0.25 oz (Suppression value)

Note: Always set C46 back to 0 after using C ● code otherwise the keyboard will be reversed the numbers will not match the display. Example: #3 is pressed and #9 will display.

Setup for Eprom versions 1.60 & 1.61

C47: Sets the computer to operate in a specific balancer mode, either Geodyna 40, 60, 80, 80.E, 40. P
The display will show: GEO 40, or GEO 60, or GEO 80, or GEO 80.E or GEO 40.P
Press the ● key to change.

When this code is accessed it will automatically set the following to these default values

C1 = 0	C11 = 1 (N/A Geo 40)	C80 = 160 (Geo 40 & 60 only)
C2 = 1	C13 = 0	
C3 = 1	C15 = 1	
C5 = 1	C17 = 10	
C8 = 3.50	C20 = 20 (Version 1.61 only)	
C9 = 0.25	C24 = 1	

ADJUSTMENT CODE LIST

C14 Operator Calibration

(EPROM VERSION 1.52 AND ON)
C18: Adjustment of automatic measuring gauge for rim diameter
Geodyna 40 Limited Edition / 80 Series
Note: For Eprom program version 1.51 refer to Program Updates

(EPROM VERSION 1.52 AND ON)
C19: Adjustment of automatic measuring gauge for rim width Geodyna 80.E Series
Note: For Eprom program version 1.51 refer to Program Updates

C20 Imbalance location adjustment or angle correction (Eprom Version 1.61 only)

C80 Adjustment of rim distance gauge

C81 Adjustment of rim diameter gauge (Geodyna 40 Limited Edition / 80 Series)

C82 Adjustment of rim width gauge (Geodyna 80.E Series)

C83 Basic adjustment of the imbalance readout

C84 Shaft imbalance correction

C4C Imbalance compensation

C15 LED light show

C50 Rim distance potentiometer -- Geodyna 40 Limited Edition / 80 Series only

C51 Rim diameter potentiometer -- Geodyna 40 Limited Edition / 80 Series only

C52 Rim width potentiometer -- Geodyna 80.E Series only

C53 Display test

C54 Opto electronic test

C55 Unregulated D.C. voltage at Processor circuit board

C59 Value of the shaft imbalance compensation stored in the Memory

C60 Shaft RPM

C61 Reference imbalance Value determined during last C83 adjustment

C62 Imbalance location displayed in degrees

C63 Continuous high resolution imbalance measurement averaged and displayed each 40 revolutions.

C64 Pick-up sensitivity

C65 Pick-up phase difference in percent

C66 Virtual vibratory system dimensions determined during last C83 adjustment

C68 Number of revolutions required to reach measuring speed

C69 Automatic testing measurement cycle intervals

C74 Position disc. Opto electronic test. Also see C54.

C75 Pick-up test / Opto Electronic test

ERROR CODE DIRECTORY

Many of the error codes are followed by the most probable cause of the error & / or action to be taken. This action assumes proper electrical/electronic wiring connections.

E0 Keyboard entry of a non-existent error code.

E1 with → display
Rim distance setting is impractical for balancing using the selected ALU 2 or 3 mode. The distance between the rim center flange and left correction plane is too narrow.

E1 with ↔ display
Rim width entered is out of range.

E1 with ↕ display
Rim diameter entered is out of range.

E2 Wheel guard is not closed.

E3 Distance gauge is not in the rest position.

E4: Width gauge is not in the rest position.

Symptom: After pressing start key an E3 and/or E4 appears

Cause / Remedies: On a machine with automatic distance, diameter and/or rim width gauges these codes occur because one of the gauges is not in the rest position. See Adjustment codes C80C, C81C, C82C.

On a machine without automatic measuring gauges these codes can be caused by a defective processor board, interface board. Or a micro residue build up on the interface board. Replace Defective board.

E5: Wheel is too far out of balance for zero balance compensation during function code C4, or calibration weight was inserted by mistake during CAL 1.

E6: Calibration weight was not inserted during Cal 2 step of the user calibration - or both pick-ups are disconnected.

E7: ALU mode was selected after rim dimensions have been entered in mm. Dimensions must be entered in inches (width & diameter) to use the ALU modes.

ERROR CODE DIRECTORY
(cont.)

E8: During tire matching the valve position was not entered.

E9: Tire matching error:
- An error was made following the procedure.

or

- The wheel was incorrectly centered on the adapter.

or

- The tire was incorrectly mounted on the rim.

E15: During operator calibration: (C14C)
The correction factors used for calibration are incorrect.

Causes:

1. The Geodyna 40/60/80 Series uses a wheel adapter that is different than many earlier model Hofmann balancers. The machines use a longer threaded center sleeve. The backing plate (the surface the wheel presses against) is extended about 3/4" from previous versions.

   Both types of wheel adapters can be used but it is necessary to set the Distance Gauge Adjustment to match the adapter used. See Adjustment, Distance Gauge. Follow instructions using code C 80 C. Also Readjust using codes appropriate for each balancer model C81, C82, C83, C84. The value determined must be stored in the memory, see Store Adjustments in Memory.

2. The Pick-up output voltage has changed. Check and replace pickups if necessary.

3. There may be a wheel weight lodged in or along side the vibratory structure.

E30: The shaft did not reach measuring speed within 120 revolutions. Check the drive motor, Opto electronic using codes C54 & C74.

E31: The balancer shaft attempted to turn in the wrong direction.
Check the drive motor connections, and start capacitor.

E34: Phase difference between Pick-ups is more than 3°. See codes C61, C65 & C75.

1) Check the Pick-up connections at the Interface circuit board. Are they connected to the correct terminals?
2) Check that the Pick-ups are tightly mounted under the shaft in the Vibratory assembly.
3) Check that the four vibratory assembly mounting bolts are tight.
4) Replace the Pick-ups one at a time.

Note: The display is the phase difference found during the last C83 adjustment. In order to display another value it is necessary run C83 again after replacing each Pick-up.

E35: Left Pick-up output voltage does not correspond to rim width or distance settings during code C83 adjustment. See E36 for troubleshooting.

E36: Right Pick-up output voltage does not correspond to rim width or distance settings during code C83 adjustment.

To trouble shoot:

1) See Code C61C
2) Check that the actual rim width (use Hofmann calipers), and distance has been set. Has the C80 procedure (rim distance adjustment) been properly followed?
3) Check that the machine is sitting solidly on the floor and only resting on the three mounting pads. Tilt the machine back to check underneath for wheel weights, etc.
4) If the machine is bolted to the floor make sure either all bolts are tight or all are loose to eliminate the possibility that one mounting pad is not solidly touching the floor. It is best to loosen all three mounting bolts and tilt the machine back to check for anything under the machine.
5) Check for a wheel weight lodged in or along side the vibratory structure.
6) Check the Pick-up connections at the Interface circuit board. If E36 displayed with E34 it's likely the problem is a defective pick-up.
7) Check that the Pick-ups are tightly mounted under the shaft in the vibratory system. They should not turn by hand.
8) Check that the four vibratory system mounting bolts are tight.
9) Try C83 Readout adjustment again using another wheel and tire assembly or only a wheel. If C83 adjustment was attempted using a thick alloy wheel try adjustments again using a steel wheel.

ERROR CODE DIRECTORY
(cont.)

E50: Eprom defective. The Eproms are mounted on the Processor circuit board sockets ROM 1 and ROM 2 and are field replaceable. When this error code appears both Eproms should be replaced.

E51: Ram defective. The Ram is not field replaceable - replace the Processor circuit Board.

E52: Left A/D Converter defective. The A/D converter is not field replaceable - replace the Processor circuit Board.

E53: Right A/D Converter defective. The A/D converter is not field replaceable - replace the Processor circuit Board.

E54: Power supply to the machine measured at the Processor circuit board is low. See Error Diagnosis section C55.

E55: Power supply to the machine measured at the Processor circuit board is high. See Error Diagnosis section C55.

E56: A/D reference voltage incorrect. Replace the Processor circuit board.

E58: Processor circuit board error, PIO. Replace the Processor circuit board.

E60: Display error. One of the seven segment displays or LED's is defective. Replace the Display circuit board.

E61: Start, stop or keyboard key is stuck closed. Can be the Display circuit board or the Processor circuit board defective. If replacement of either board is necessary connect a wire from the panel ground to the machine chassis ground. Use a panel circuit board hold down stud.

E62: Memory defective. Replace the Processor or Interface circuit board. If a replacement board is not at hand adjust the machine following adjustment procedures, then leave the power on until the defective part can be replaced.

E63: Adjustment &/or function code data memory on Interface circuit board is incorrect. When the power is switched on the computer program transfers stored data from the Interface circuit board data memory to the Processor circuit board memory. If an error is detected code E63 displays. It is possible this error can occur because of loss of stored data caused by large voltage variations in the balancer power source. This could occur during lightning storms or by power distribution problems. Readjust and set function codes. If E63 reoccurs replace the Interface circuit board.

E64: 24 vdc is not available on the Interface circuit board. Check the 0.8 amp fuse on the Interface circuit board. If the fuse continues to blow there can be short at one of the contactor coils. Disconnect one at a time to trouble-shoot. The problem may also be the Interface or Processor circuit board.

E65: Power supply voltage to the Processor circuit board dropped too low during the balancing cycle to ensure accurate readings. Measure the line voltage, connections to the balancer and the internal connections. See code C55.

E70: Distance gauge defective (40 Limited Edition / 80 Series Only)

a) The potentiometer slider voltage of the distance gauge is less than 0.1 or more than 4.9 volts.
b) After pressing the STOP button it is possible to balance wheels with dimension input via the keyboard.
c) For precise trouble shooting, enter the test code "C50C" and check the following items:
   1) Is the gauge in its rest position?
   2) Is the gauge calibrated?
   3) Is the connector on interface board plugged?
   4) Does the voltage on the potentiometer slider increase steadily while moving the gauge lever?
      If items 1 to 3 are O.K., but the error code is displayed again after power on, replace the potentiometer and adjust the gauge.
   5) Is the handle lever from the distance gauge off?

E 71: Rim diameter gauge defective (40 Limited Edition / 80 Series Only)

a) The potentiometer slider voltage of the diameter gauge is less than 0.1 or more than 4.9 volts.
b) After pressing the STOP button it is possible to balance wheels with dimension input via the keyboard.
c) Enter the test code "C51C" and check the following items:
   1) Is the gauge calibrated?
   2) Is the connector on interface board plugged in?
   3) Does the voltage on the potentiometer slider increase steadily while turning the gauge lever?
      If items 1 to 2 are O.K., but the error code is displayed again after power on, replace the potentiometer and adjust the gauge.

E 72: Rim width gauge defective (80.E Series Only)

a) The potentiometer slider voltage of the rim width gauge is less than 0.1 or more than 4.9 volts.
b) After pressing the STOP button it is possible to balance wheels with dimension input via the keyboard.
c) For precise trouble shooting, enter the test code "C52C" and check the following items:
   1) Is the gauge in its rest position?
   2) Is the gauge calibrated?
   3) Is the connector on the interface board plugged in?
   4) Does the voltage on the potentiometer slider increase steadily while moving the gauge lever?
   If items 1 to 3 are O.K., but the error code is displayed again after power on, replace the potentiometer and adjust the gauge.

E73: Transmitter (IR LED) of Opto electronic defective. Test using codes C54 & C74 & C75. Opto electronic, Processor board may be defective.

E74: No pulses are measured from the Opto electronic. The Processor circuit Board does not recognize that the balancer shaft is turning. Does the shaft turn? If yes, test using codes C54 & C74. Opto electronic or Processor circuit board may be defective. If not, the error code is not caused by the Opto electronic. Check the power to the machine, internal electrical system, motor relay, fuses and connections. If the motor can be heard turning but the balancer shaft does not, check the drive belt and tension assembly. If the motor hums only and E74 comes on after a few seconds, it may be a defective start capacitor. It may be also a incorrectly wired wheel guard switch, especially if the C13C code is set to 1.
Remedy: Replace wheel guard switch

ERROR CODE DIRECTORY
(cont.)

E76: Left Pick-up reference voltage incorrect. To trouble-shoot see E77.

E77: Right Pick-up reference voltage incorrect. To trouble-shoot:
1. Switch the power off. Unplug both Pick-ups from the Interface circuit board. Switch the power on. If E76/77 still displays replace the Interface circuit board. If not go to 2.
2. Switch the power off. Plug the left Pick-up into the right terminal and the right Pick-up into the left. Switch the power on. If the error code follows the Pick-up replace the Pick-up. If not replace the Interface circuit board.

Symptom: After turning on power E76 and/or E77 appears.
These error codes indicate a wrong D.C. voltage on the left and/or right transducer (Pick-up). These voltages can be observed using code C75C then press #5. The proper voltage should be 2.50 +/- 0.05 volts.

Cause: These error codes can be caused by a defective interface board or a build up of film on the board. The latter fault will become evident in very humid conditions.

E78: Incorrect output is measured from the left Pick-up. See code C75.
Left Pick-up, Processor or Interface circuit board may be defective.

E79: Incorrect output is measured from the right Pick-up. See code C75.
Right Pick-up, Processor or Interface circuit board may be defective.

E80: Basic calibration data was not found in the memory. Can be that steps 5 and 6 were not stored in the memory during basic adjustment (C83). Reset the Function codes and then follow the adjustment procedures, C83 & C84. If error code E80 repeats replace the Interface circuit board.

E136: Computer data line defect. Check ribbon cable to Processor board (loose plug). Replace the Processor or Interface Circuit board.

ACCURACY TESTS

SHAFT IMBALANCE, WHEEL ADAPTER TO SHAFT REMOUNT TEST

1. Make sure electronic compensation is off. Check by entering code C4, 0 must be displayed. If 1 appears switch the balancer off and then back on after a few seconds.

2. Set the corresponding rim dimensions and balance a medium size 14" tire to 0.00 ounce in both planes. Balance to exactly 0.00 in both planes with the small imbalance suppression (C2) turned off.

4 Operate the balancer a few times and insure that no more than 0.05 oz. is displayed.

5. Using the supplied 14 mm Allen wrench loosen the Allen bolt located in the center of the threaded sleeve.

6. Rotate the wheel adapter with the balanced tire 180° on the balancer shaft then tighten the Allen bolt.

7. Operate the balancer. The new imbalance displays should not be larger than 0.25 oz.

This test proves the wheel balancer shaft is balanced, turns true and that the wheel mounting adapter and balancer conical shaft mating surfaces are true.

If the test produces readings out of tolerance:

1. Remove the complete wheel adapter and operate the balancer. The display should indicate zero. If not balance the shaft following Code C84 - see Adjustment Procedures.

2. Remove the wheel adapter and check the mating surfaces of the wheel adapter and balancer shaft. They should be clean and smooth. After cleaning if a further test still produces unacceptable results:

A: Run the above test using a known good wheel adapter. If another test produce the same results go to B. If not, replace the threaded sleeve portion of the wheel adapter.

B: Using a dial indicator, measure the run out at the balancer shaft conical surface. The acceptable tolerance is 0.0015". If out of tolerance replace the balancer shaft.

WHEEL ADAPTER COMPONENTS - CENTER CONE ADAPTER REMOUNT TEST.

Important note: Please read first

The test will check the wheel as well as the wheel adapter. Most wheels are manufactured to less exact tolerances than the wheel adapter. The majority of the measured remount error is usually caused by the wheel - not the wheel adapter. It is best to use a wheel that is known to be true. The wheel must have a round smooth center hole and the surface that presses against the wheel adapter backing plate must be flat and smooth. Because remount error is a function of mechanical tolerances the heavier the wheel assembly the larger the mounting error. Use a mid size 14" or 15" wheel and tire - about 30 to 40 pounds. Usually OEM alloy wheels will remount best.

1. First, make sure the results of the SHAFT IMBALANCE, WHEEL ADAPTER TO SHAFT REMOUNT TEST are acceptable.

2. Electronic imbalance compensation must be off. Check by entering code C4. 0 must be displayed. If 1 appears switch the balancer off and then back on after a few seconds.

3. Balance a 30 to 40 lb. wheel, to exactly 0.00 in each plane with the small imbalance suppression (C2) turned off.

4. Operate the balancer a few times and insure that no more than 0.05 oz is displayed.

5. Loosen the wing nut, hold the centering cone in place and rotate wheel 180 degree. Tighten the wing nut.

6. Operate the balancer through a cycle. The new display is the remount error. A reading not larger than 0.50 ounce is generally acceptable.

If the readings are not acceptable:

1. Are you using a wheel known to be true? See Important Note above. Try the test using another wheel.

2. Are the mating surfaces of the wheel adapter backing plate and the threaded sleeve clean and smooth?

3. Is there a large amount of play between the center cone and threaded sleeve? Check against another cone in the set. Run the same test but this time only rotate the **cone** 180 degree.

4. Using a dial indicator measure the radial run out of the threaded sleeve at the point where the threads end. The acceptable tolerance is 0.0015".

5. Using a dial indicator measure the lateral run out of the wheel adapter face plate as the shaft is rotated 360 degree. The acceptable tolerance is 0.0015".

6. Use known good wheel adapter components individually to localize the cause of the unacceptable remounting error.

ACCURACY TESTS
(cont.)

C4 - Use this code to check the balancer imbalance read-out accuracy to insure that the proper size and location of the correction weight is called for.

To use:

1. Mount a wheel, enter rim sizes, and then balance the wheel to within 1 ounce on each side.
   Enter C 4 C. A 0 will show in the right display, C4 in the left.
   Press START (green).

2. The balancer will run through a cycle, stop and display a 1 in the right display. The 1 displayed means that the out of balance wheel has been measured by the computer. The measured imbalance will be subtracted from the next measurement runs. The test wheel imbalance will remain stored in the computer memory until the machine is switched off or until C4 is again selected and the 1 is changed to a 0 by pressing the ● button.

3. Press and hold the STOP (red) button. The right and left display will each show 0.00. Release the STOP button.

4. Select a hammer on type wheel weight of about 3 ounces for this test. It is important that you are sure that the actual weight agrees with what is marked on the weight. Be sure that the weight has not been clipped.

5. Attach the weight to the right side of the wheel, then operate the balancer.

6. When the balancer stops press and hold in the STOP (red) button. A weight reading corresponding to the test weight is shown in the right display. The allowable tolerance is +/- 0.15 ounce.

7. A weight reading is also shown in the left display. The maximum allowable reading is 0.15 ounce. If it's out of tolerance see (A) on next page. Release the STOP (red) button.

Example:

If a 3 ounce test weight was selected. It is acceptable if the display shows between 2.85 and 3.15 for test weight side and no more than 0.15 for the opposite side.

ACCURACY TEST
(cont.)

8. Position the test weight at exactly 6 o'clock. The center bar of the right location display should be on. The allowable tolerance is +/- one bar from center. If it's out of tolerance see (B). Remove the test weight from the right side of the wheel and attach it to the left side, then operate the machine.

9. When the machine stops press and hold in the STOP (red) button. The allowable tolerance is 0.15 ounce as shown in the example above. Release the STOP (red) button.

(A) - First check the rim distance gauge setting following code C80C. Then follow the ADJUSTMENT PROCEDURES.

(B) - If the imbalance read-out accuracy was found out of tolerance follow as per (A). If only the location accuracy was found to be out of tolerance the wheel has probably slipped on the balancer shaft while braking it. There is also a slight possibility that there is a problem with a pick-up or Opto electronic. If these two components are suspected substitution with known good parts is the only method of trouble-shooting.

TO END THE TEST PRESS C 4 C, THE ● KEY, & THE STOP BUTTON.

USING THE DIAGNOSTIC CODES

To use the codes enter C code # then C.

C50 - Use this code to check the rim distance gauge potentiometer.
Geodyna 40 Limited Edition / 80 Series Only

To use:

Enter **C50C** A voltage reading corresponding to the position of gauge is shown in the left display. A measurement in millimeters (mm) corresponding to the position of the gauge is shown in the right display. With the gauge lever in its rest position a voltage reading of between 0.12- 0.25 should be displayed. As the lever is extended the voltage reading should increase proportional to the distance moved up to a maximum of about 5.00 volts. Be sure that the voltage does not increase or decrease erratically. If the voltage is out of tolerance see notes below.

**********TO END THE TEST PRESS THE STOP BUTTON**********

C51 - Use this code to check the rim diameter gauge potentiometer.
Geodyna 40 Limited Edition / 80 Series Only

To use:

Enter **C51C** A voltage reading corresponding to the position of the gauge is shown in the right display. A measurement in millimeters (mm) corresponding to the position of the gauge is shown in the right display. As the gauge lever is rotated 360 degrees the voltage should change evenly through the range of 0 volts to 5.00 volts. If the voltage does not change or changes erratically see notes below.

**********TO END THE TEST PRESS THE STOP BUTTON**********

C52 - Use This Code to check the rim width potentiometer. Geodyna 80.E Series Only

Enter **C52C** A voltage reading corresponding to the position of the gauge is shown in the left display. A measurement in millimeters (mm) corresponding to the position of the gauge is shown in the right display with gauge lever in its rest position a voltage of between 0.12 - 0.50 should be displayed. If the voltage is out of tolerance see Notes below. As the lever is moved toward the machine the voltage should increase proportional to the distance as moved up to a maximum of about 5.00 Volts. Be sure that the voltage does not increase or decrease erratically. If it does see notes below.

**********TO END THE TEST PRESS THE STOP BUTTON**********

Notes for Codes C50, C51, C52:

1. A voltage which is out of tolerance with the gauge in its rest position indicates that the gauge needs to be adjusted following the "Adjustment Procedures".

2. A voltage which does not change or changes erratically indicates that the potentiometer is defective, or there is a mechanical problem such as the potentiometer shaft is loose at the gear or loose or broken wire, etc.

C53 - Use this code to check the display circuit board.

Enter **C53C** All LED segments will light.

If one or more segments are defective, error message E60 would have displayed when the machine was switched on. To correct for a missing segment, it is recommended to replace the display circuit board.

**********TO END THE TEST PRESS THE STOP BUTTON**********

C54 - Use this code to check the Opto electronic. The complete test consists of four sections and is done with the motor turning the shaft. Also see test code C74.

- Enter C 5 4 C - Press start.
  This is the A channel test. 1 will show in the left display. The right display will show a number which may fluctuate +/- two numbers. This number should be within the range of 40 - 60.

- Press the ● button. 2 will show in the left display. This is the B channel test. The right display will show a number which may fluctuate +/- two numbers. This number should be within the range of 40 - 60.

- Press the ● button. 3 will show in the left display. This is the zero reference test. The right display will show a number which may fluctuate +/- two numbers. This number should be within the range of 40 - 60.

- Press the ● button. 4 will show in the left display. The right display will show a number which may fluctuate +/- two numbers. This number should be within the range of 20 -35.

You may monitor each test repeatedly by pressing the ● key.

If any of these tests display readings which are not within the specified range the Opto electronic may need replacing. It is only recommended to replace the Opto electronic if an out of tolerance reading is found along with a machine malfunction. It is not recommended to replace the Opto electronic if the above tests indicated a reading slightly out of tolerance.

**********TO END THE TEST PRESS THE STOP BUTTON**********

USING THE DIAGNOSTIC CODES
(cont.)

C55 - Use this code to check for proper D.C. voltage at the Circuit Board. A function of the Processor circuit board is to provide a DC power supply. Depending on operating voltage either 115 or 230 volts AC is supplied to the transformer primary. The transformer reduces the voltage at the secondary to approx. 18 - 27 volts AC. The secondary voltage is converted by the power supply portion of the processor circuit board to DC voltage, filtered and regulated. The DC voltage is used to operate the electronic circuits and motor control relays.

Enter C 55 C - The right display indicates the DC voltage. The allowable working voltage is 16 to 37 VDC for Eprom version 1.61 & 23 to 37 VDC for Eprom version 1.2 -1.60.

If error E54 was displayed when the machine was turned on, less than the allowable voltage will be measured.

If error E55 was displayed when the machine was turned on, more than 37 VDC will be measured - SWITCH THE POWER OFF! Disconnect the Processor circuit board 34 pin connector for further troubleshooting.

To trouble-shoot check the voltage at the wall receptacle, the input voltage to the balancer at the transformer primary, and the output voltage from the secondary.

**********TO END THE TEST PRESS THE STOP BUTTON**********

C59 - Use this code to display the shaft imbalance compensation value stored in the memory. The value is determined during the Shaft Balance procedure (C84). Enter C 5 9 C. The displayed value is the shaft compensation in kg mm.

**********TO END THE TEST PRESS THE STOP BUTTON**********

C60 - Use this code to measure the speed of the balancing shaft. The Processor circuit board counts pulses received from the Opto electronic. These pulses are the result of a slotted disc read by the Opto electronic as the shaft turns. The pulses are routed through the Interface circuit board.

Enter C 6 0 C. Press start. The RPM is displayed. Balancing speed is 220-230 RPM (nominal).

**********TO END THE TEST PRESS THE STOP BUTTON**********

C61 - Use this code to check for changes in the Pick-up outputs. Each time the balancer readouts are adjusted using the service code C83C a reference value of 1.0000 is stored in the memory for the left and right Pick-ups separately. Whenever the readouts are adjusted using operator calibration code C14C each value of 1.0000 will change to a higher or lower value. The new value reflects the compensation made by the processor circuit board depending on the condition of the each individual pick-up output as measured at the processor circuit board. Slight variations are acceptable and are the result of aging and temperature or changes in the circuit component path. Large variations may not be acceptable and can yield error codes or balance problems. The Pick-up outputs and the circuit component path determine readout, location accuracy and imbalance readout separation between correction planes. To monitor the reference outputs: Enter C61C. The left location LED's will light and the display will show the left Pick-up reference voltage. Pressing the decimal key will light the right location LED's and the right pick-up reference voltage displays. Pressing the decimal key will toggle between the left and right reference voltage.

The code can be helpful for troubleshooting a machine that may continually require readjustment via user calibration code C14C or a machine that develops a measurement related error code or "chases weights" ✷ during operation.

Example:

The customer complains that the machine usually does not balance a wheel to zero in one or two spins. The operator is "chasing weights" ✷ around the rim. After running the machine through C14C the technician using code C61C finds that the value for the right Pick-up is 1.0030 (little change from the reference of 1.0000), but the value for the left pick-up is .9000 (a larger change). This indicates the likely cause of the problem is a faulty or loose left pick-up ✷.

When troubleshooting be aware that the reference voltage is measured by the processor circuit board and not directly read at the Pick-up. This means that the large difference in output can have a cause other than the pickup. Be aware that in series with the Pick-up output path to the processor is the interface circuit board.

✷ Tip: Whenever a machine is "out of calibration," "chases weights" or will not go through C14C or C83C procedures without an error code always check for anything touching the internal balancing structure. It is always necessary to remove the weight tray and check carefully for foreign material such as a stray wheel weight. It is also necessary to check under the wheel balancer making sure only the three intended points touch the floor.

USING THE DIAGNOSTIC CODES
(cont.)

C63 - Use this code to set the machine into the continuous display mode. As the shaft turns the display will blink each 40 revolutions as updated imbalance inputs are averaged. This code is helpful while trouble shooting for a intermittent or erratic read-out.

Enter C 6 3 C. Press start.

**********TO END THE TEST PRESS THE STOP BUTTON**********

C65 - Use this code to check the phase difference between the two Pick-ups. For the computer to correctly calculate the imbalance correction weight needed it is necessary that the output voltages from the Pick-ups are in phase.

Error message E34 will display during a Code C83 adjustment if the Pick-ups are detected to be out of phase by more than 3 degrees

Enter C 6 5 C - The phase difference will display.

**********TO END THE TEST PRESS THE STOP BUTTON**********

C68 - Use this code to check the operation of the electrical system.

Enter C 6 8 C. The left display shows the number of shaft revolutions required to reach measurement speed during the last measurement.

The right display shows the number of shaft revolutions required to reach the speed where the motor start capacitor switching relay dropped out during the last measurement cycle.

**********TO END THE TEST PRESS THE STOP BUTTON**********

C69 - Use this code to set up the automatic measurement cycle. This cycle can be used to allow an unattended machine to measure, brake to a stop, sit at rest, then measure, brake to a stop continuously. The rest intervals can be selected. This code is helpful while troubleshooting any intermittent problem, especially in an equipment repair shop environment.

Enter C 6 9 C. The left display will show 1. This is rest interval one. The right display will show 50.This is the preset rest interval in seconds. To change the interval key in a new interval in seconds, then press the C key. The left display will show 2. This is preset rest interval two. The right display will show 170. To change the interval key in a new interval in seconds. Press the start button. The machine will cycle continuously.

**********TO END THE TEST PRESS THE STOP BUTTON**********

C74 - Use this code as a quick check of the Opto electronic without the shaft turning under power. For the complete Opto electronic test use code C54.

Enter C 7 4 C. The left display will show C74. The right display will show a number from 0 to 255. Rotate the shaft, the numbers will change, counting in ascending order as the shaft is turned clockwise, and descending as the shaft is turned counterclockwise.

**********TO END THE TEST PRESS THE STOP BUTTON**********

C75 - Use this code to check the Pick-ups. The Pick-ups are mounted into the imbalance measuring structure of the machine. They are made of a material that when force is applied generate a voltage proportional to the force. Upon entering this test exactly 2.5 volts is applied to each Pick-up. The test measures the voltage drop across the Pick-ups.

Enter C 7 5 C then press 5. The left and right displays will each show a voltage. This voltage is a reference voltage, (about 2.50 v), less the voltage drop. The left display shows the left Pick-up reference voltage. The right display shows the right reference voltage. The acceptable tolerance is 2.45 to 2.55. A voltage below 2.20 will display an error message during the self test when power is applied to the balancer. The pick-ups are further tested by pressing down on the balancer shaft while watching the displays. The displays should vary above and below the nominal 2.50 volts.

This test proves if the Pick-ups are shorted, open or disconnected from the Interface circuit board. A successful test also proves that the output voltage path from the pick-ups through the Interface to the Processor circuit board is in order.

The test does not prove that the Pick-ups are producing the proper output voltage, that they are in phase, or properly installed mechanically. Further troubleshooting is by substitution with a known good part.

Note: Voltage readings below 2.45 are suspect especially when erratic or intermittent measurement problems have been noticed or error codes have appeared, such as: E34, E35, E36 during Adjustment procedures or E76, E77, E78, E79 during Operators Calibration.

********TO END THIS TEST PRESS THE STOP BUTTON*********

C75 - Use this code to test the Opto electronic, whenever an E73 appears

Enter C75C, then Press 6. The left display shows the voltage across IR led. The proper voltage is approximately 1.20 Volts.

If displays shows 0.00 volts, unplug opto. If the Voltage changes to 5.00 volts then opto is defective. If the Voltage does not change, then the Interface or Processor board is defective.

If the display shows 5.00 volts with opto plugged in then using a screwdriver, short the 2 - 3 mm screws on the opto. If the voltage drops to 0.00 volts, then opto is defective. If the voltage does not drop, then opto cable is damaged, interface or processor board is defective.

********TO END THIS TEST PRESS THE STOP BUTTON*********

ADJUSTMENT PROCEDURES

PARTS REPLACEMENT - WHICH READJUSTMENT IS NECESSARY?

Many machine components, with the following exceptions, can be replaced without resetting the function codes or readjusting the machine.

Exceptions:

Eproms	See Note A
Processor circuit board	See Note B
Interface circuit board	See Note A
Pick-up's	See Note B
Machine shaft, bearings or drive components	See Note B
Rim Width potentiometer (Geodyna 80.E Series)	See Note C
Rim Diameter potentiometer (Geodyna 40 Limited Edition / 80 Series)	See Note D
Rim Distance potentiometer (Geodyna 40 Limited Edition / 80 Series)	See Note E

Note A: After replacement, perform these codes:
C47C, C80C, C81C, C82C, C18C, C19C, C83C, C84C, C20C, C10C

Note B: After replacement, perform these codes:
C83C, C84C, C20C, C10C

Note C: After replacement, perform these codes:
C82C, C19C, C10C

Note D: After replacement, perform these codes:
C81C, C18C, C10C

Note E: After replacement, perform these codes:
C80C, C10C

ADJUSTMENT PROCEDURES

IMPORTANT ! DO NOT TURN OFF THE POWER THROUGHOUT THE ADJUSTMENTS

AFTER COMPLETING THE FOLLOWING PROCEDURES THE DATA MUST BE STORED IN THE COMPUTER MEMORY SO THAT IT IS RETAINED WHEN THE POWER IS SWITCHED OFF.

SET FUNCTION CODES TO ORIGINAL FACTORY SETTINGS:

The Setup for Eprom versions 1.60 and above are on the next page

Setup for Eprom versions 1.2 - 1.53

- Enter C 47 C. For Eprom program version 1.51 to 1.53 the display will show:

  GEO 40 GEO 60 GEO 80 GEO 80.E

  Press the ● button repeatedly until the machine model is displayed.
  Press the STOP button.

Note: For balancer modes in previous Eprom program versions refer to Program Updates.

- Enter C 4 6 C. 0 or 1 will appear in the right display. If 1 appears press the STOP (red) button.
  If 0 appears press the ● key. 1 will appear. Press the STOP button.

- Enter C ● C (C 0. will display briefly).
- Enter C 4 6 C. 1 will appear in the right display.
  Press the 0 key. 0 will appear. Press the STOP button.

Note: Always set C46 back to 0 after using the C0 code otherwise the **keyboard will be reversed.**

- Enter code C 2 4 C, 1 should display.
  If 0 displays press ● key to change. Press the Stop button.

To enter rim distance in centimeters (Correct Setting)

To enter rim distance in millimeters (Incorrect Setting)

Reset any individual Function Codes if necessary - See Setting Function Codes.

Continue on with the Rim Distance Gauge Adjustment

Setup for Eprom version 1.60 & 1.61

■ Enter C 47 C. The display will show:

GEO 40 GEO 60 GEO 80 GEO 80.E GEO 40. P

Press the ● button repeatedly until the machine model is displayed.
Press the STOP button.

GEO 40	Geodyna 40 Balancer
GEO 60	Geodyna 60 Balancer
GEO 80	Geodyna 80 / 80HP Balancers
GEO 80.E	Geodyna 80E / 80 EHP Balancers
GEO 40.P	Geodyna 40 Limited Edition

Note: When this code is accessed it will automatically set the following to these default values

C1 = 0	Readout Resolution 0.25 oz.\ 5 gr.
C2 = 1	Readout suppression on
C3 = 1	Readout display in ounces
C5 = 1	Brakes when wheel guard lifted
C8 = 3.50	Suppression value in grams
C9 = 0.25	Suppression value in ounces
C11 = 1 (N/A Geo 40)	Index position brake on
C13 = 0	Wheel guard start off
C15 = 1	LED light show on
C17 = 10	Number of revolutions for measurement
C20 = 20 (Version 1.61 only)	Angle correction
C24 = 1	Distance entry in cm
C80 = 160 (Geo 40 & 60 only)	Adapter flange distance in mm

Reset any individual Function Codes if necessary - See Setting Function Codes.

Continue on with the Rim Distance Gauge Adjustment

Rim Distance Gauge Adjustment Geodyna 40/60

1. Enter C 8 0 C. A number will appear in the right display.

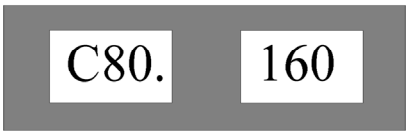
2. Hold a straight edge against the wheel contact surface of the wheel adapter backing plate.

3. Measure the distance in **mm** from the wheel contact side of the straight edge to the flat surface of the distance gauge in the rest position. Record the measurement. Subtract 25. The remainder will be used in step 5.

4. Enter the remainder found in step 4. It will replace the number shown in step 2.

5. Press the C button.

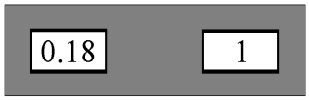
   Example: The scale reading was 185.
   185 - 25 is 160.
   Enter 160, press the C button.



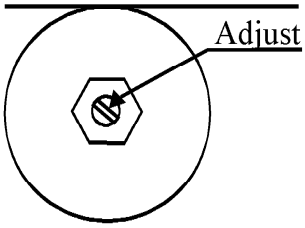
7. Continue on with Readout Adjustment.

Rim Distance Gauge Adjustment Geodyna 40 Limited Edition / 80 Series

1. Enter code C 8 0 C
With the gauge in the rest position the left display must indicate between 0.12 - 0.25



If adjustment is necessary:



For the Geodyna 40 Limited Edition.
Turn power off, remove the gauge lever, front panel and weight tray. Then place front panel on a non-conductive surface and reconnect front panel, place gauge lever back on. Then turn power on and enter C 80 C. Loosen the nut. Change the position of the slotted potentiometer shaft in the center of the distance gauge pulley until the left display shows between 0.12 - 0.25. Re-tighten nut.

For the Geodyna 80 Series.
Turn power off, remove the gauge lever, display housing and weight tray. Reassemble the display housing and front panel. Replace the gauge lever. Turn power on and enter C 80 C. Loosen the nut. Change the position of the slotted potentiometer shaft in the center of the distance gauge pulley until the left display shows between 0.12 - 0.25. Re-tighten nut.

3. With the display indicating between 0.12 and 0.25 press the "C" key.

4. Hold a straight edge against the wheel contact surface of the wheel adapter backing plate, measure the distance in **mm** from the wheel contact side of the straight edge to the flat surface of the distance gauge in the rest position. Record the measurement and subtract 25. The remainder will be used in step 5.

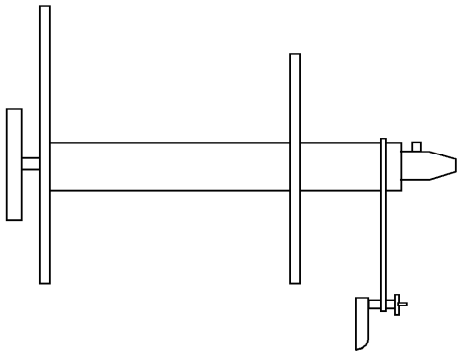
   Example: The measured distance was 185 mm.
   185 - 25 = 160 mm.

5. Slide the distance gauge out until the distance gauge scale reads the remainder found during step 4 (example: 160 mm). Hold the gauge exactly in this position and press the "C" key.

6. Reassemble the weight tray, front panel, display housing, gauge lever and continue on to Rim Diameter Gauge Adjustment.

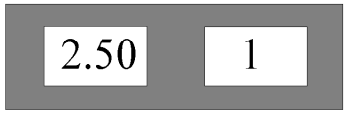
Rim Diameter Gauge Adjustment Geodyna 40 Limited Edition / 80 Series

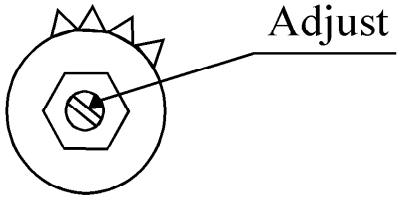
1. Place a heavy rubber band around the shaft housing and the distance/diameter gauge pointer as shown in the diagram.



2. Enter **C81C**

3. Set the center point.
In the left display is a voltage reading corresponding to the setting of the rim diameter gauge potentiometer. It should be between 2.40 and 2.60.





If adjustment is necessary:

For the Geodyna 40 Limited Edition.
Turn power off, remove the gauge lever front panel and weight tray. Then place front panel on a non-conductive surface and reconnect front panel. Turn power on and enter C 81 C. Replace the gauge lever. Loosen the nut. Using a screwdriver change the position of the slotted potentiometer shaft in the center of the gear. Re-tighten the nut.

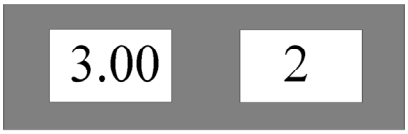
For the Geodyna 80 Series.
Turn power off, remove the gauge lever, display housing and weight tray. Reassemble the display housing. Replace the gauge lever. Turn power on and enter C 81 C. Loosen the nut. Using a screwdriver change the position of the slotted potentiometer shaft in the center of the gear. Re-tighten the nut.

4. Remove the rubber band and mount a wheel onto the machine.

Rim Diameter Gauge Adjustment Geodyna 40 Limited Edition / 80 Series

5. Set the linearity.

   A Place the rim distance/diameter gauge upwards against the rim as if making a normal measurement. Hold in this position and press the "C" key.



   B Place the rim distance/diameter gauge downwards against the rim, hold in this position and press the "C" key.

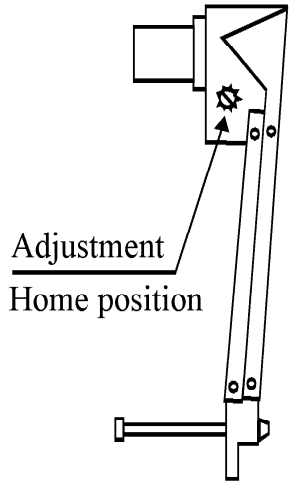
6. Final Adjustment made with C18C (Eprom versions 1.52 and above).

Rim Width Gauge Adjustment Geodyna 80.E Series

The distance gauge has to be adjusted prior to calibration of the rim width gauge.

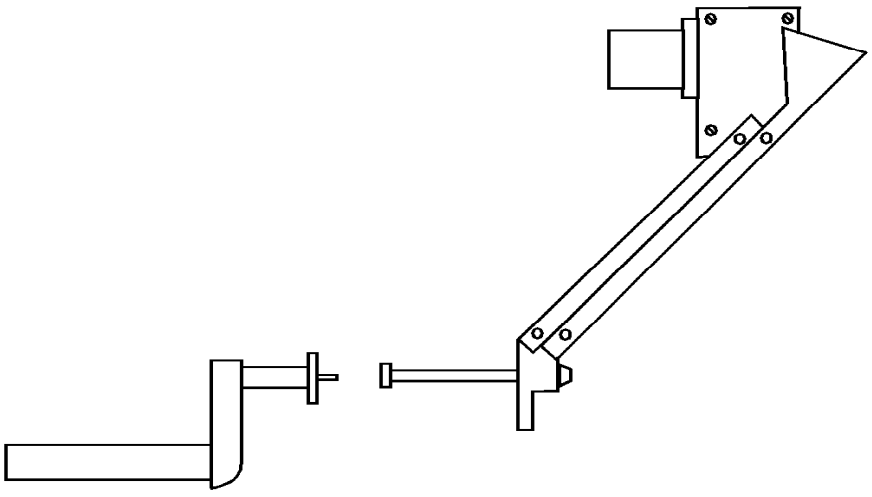
1. Enter code **C82C**

2. The left display shows the slider voltage of the rim width potentiometer in volts. The right display shows the adjustment step. In the home position (right limit position) the voltage should be set to between 0.12 and 0.50 volts. If adjustment is necessary remove cover by removing 3 screws. Loosen the nut. Using a screwdriver change the position of the slotted potentiometer shaft in the center of the gear, until the left display shows between 0.12 and 0.50 volts. Re-tighten the nut. Press the "C" key, the value of the home position is stored. In the right display, #2 is displayed.



Rim Width Gauge Arm

3. Pull out the distance gauge and the rim width gauge (gauges will not touch) so that both gauges are at their maximum extension as shown below, and press the "C" key again. This completes the C82C adjustment. The final adjustment to compensate for mechanical differences from machine to machine, is made with C19C.
(Eprom Version 1.52 and above)



Final Adjustment of Rim Diameter Geodyna 40 Limited Edition / 80 Series
EPROM VERSION 1.53 and higher **(For Eprom Versions 1.51 & 1.52 See Program Updates)**

Mount a rim with or without a tire on the machine

Rim diameter:

1. Note the diameter as read off the tire or rim.
   Example Actual = 15”
2. Enter C18C
3. Press and release the diameter button
4. Hold the diameter gauge against the rim as taking a measurement
5. The left display indicates the measured diameter.
   Example: Measured = 15"5”
6. Note the difference between the **Actual** rim diameter from step 1 and the ***M*easured** diameter using the gauge from step 5.
   Example: Actual 15” – Measured 15.5” = "5
7. Enter the difference noted through the keypad.
   Example: Press "5
8. If the gauge measurement was higher than the actual rim diameter, *as in the example*, press the S/D key. If the gauge measurement was lower go to step 9.
   Example: Press the S/D key
9. Press the C key.
10. Press the STOP key.
11. Test the rim diameter gauge to insure it is reading correctly. If not repeat steps 1 – 10
12. Store the setting into the computer memory. See G.

Final Adjustment of Rim Width Geodyna 80.E Series

EPROM VERSION 1.53 and higher **(For Eprom Versions 1.51 & 1.52 See Program Updates)**

Mount a rim with or without a tire on the machine

Rim Width:

1. Note the width as read off the rim or measured with a manual gauge.
   Example: Actual = 7.5”
2. Enter C19C
3. Press and release the width button ↔
4. Hold the width gauge against the rim as taking a measurement
5. The left display indicates the measured width.
   Example: Measured = 6.5”
6. Note the difference between the ***Actual*** rim width and the width ***Measured*** using the automatic gauge.
   Example: Actual 7.5” – Measured 6.5” = 1
7. Enter the difference noted through the keypad.
   Example: Press 1
8. If the gauge measurement was higher than the actual rim width press the S/D key. If the gauge measurement was lower, as in the example, go to step 9.
   Example: go to step 9
9. Press the C key.
10. Press the STOP key.
11. Test the rim width gauge to insure it is reading correctly. If not repeat steps 1 - 10
12. Store the setting into the computer memory. See G.

Readout Adjustment (Basic Re-calibration) All Models

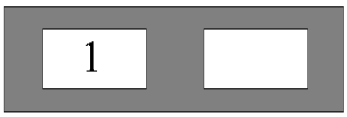
A) Mount a wheel and set corresponding rim width, distance and diameter.

B) Balance the wheel to within 1.00 ounce in each plane.

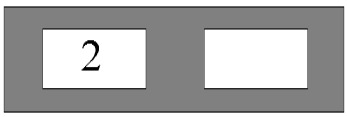
C) Select a test weight of 3.5 ounces (99 grams) or any size between 3 and 4 ounces. 1 ounce = 28.35 grams

D) Enter C 83 C

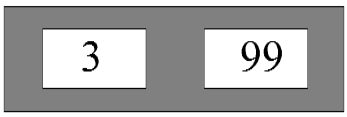
1. Press "start", the machine will run through a cycle.



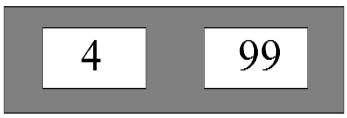
2. Enter the size of the selected test weight in **grams**, then press "C".



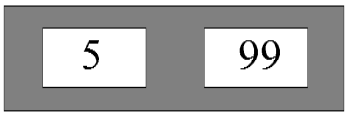
3. Attach the test weight on the left side of the wheel. Press "start".



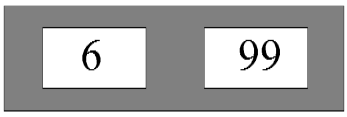
4. Remove the test weight from the left and attach it on the right. Press "start".



5. Remove the wheel and wing nut, pressure cup, cone and spacer ring. Leave only the threaded sleeve and backing plate on the balancer shaft. Press "start".



6. Thread the calibration weight into the wheel adapter backing plate. Press "start".



CAUTION: IF ERROR CODE E34, E35, OR E36 APPEARED DURING THE C83 ADJUSTMENT - IT IS NECESSARY TO FIND AND CORRECT THE CAUSE OF THE ERROR BEFORE STORING INTO MEMORY.

Following the above procedure cancels the value stored in the memory to compensate for shaft imbalance. **It is always necessary to balance the shaft**.
Continue on to step E.

E) Balance the Shaft

1. Remove the wheel and wheel adapter including the cones, threaded sleeve and adapter backing plate.

2. Enter C 84 C.

3. Press "start".

F) Imbalance Location Adjustment **<u>Eprom Version 1.61 only</u>**

1. Mount and balance a wheel to within 1 ounce.

2. Enter C 4 C then press the START button. The balancer will run through a cycle, stop and display a 1 in the right display. Press the STOP button.

3. Attach a weight to the outside of the wheel. Press the START button. After the wheel stops rotate it until only the center bar is on in the right hand display, weight should be at 6:00. If the weight is not at 6:00 proceed to step 4. If it is proceed to step G.

4. To adjust remove the screws from the display panel and for the 60/80 Series remove the display housing and weight tray. For the 60/80 Series reconnect display panel, and go through steps 2 & 3 again.
After steps 2 & 3 have been done unplug the opto electronic cable.

5. Enter C 20 C. Reconnect the opto electronic cable. A number will appear in the right hand display. If the weight is before 6:00 enter a number higher than the displayed (default) number, press the C button. If the weight is after 6:00 enter a number lower than the displayed (default) number, press the C button. Press the START button and check to see if the location is correct, if not perform adjustment again.

6. Continue on step G, storing the calibration data into the permanent memory.

AFTER PERFORMING THE ADJUSTMENT PROCEDURES THE CALIBRATION DATA MUST NOW BE STORED IN THE COMPUTER MEMORY SO THAT IT WILL BE RETAINED WHEN THE POWER IS SWITCHED OFF.

To store the adjustments into the computer memory:

G) Store adjustments and function codes into the machine memory

1. Enter C 10 C

2. Press buttons 1 and 3 at the same time. The Processor circuit board issues three tone signaling the code setting has been stored in the memory.

Operator Calibration

Intended for the user to "fine tune" the balancer calibration, it can also be used by the service technician rather than "Readout Adjustment" if only a slight readjustment to the readout accuracy is required. The basic theory:

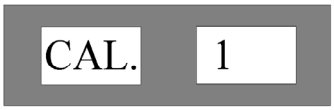
During certain steps of the Readout Adjustment (C 8 3 C procedure) imbalance forces created with and without a calibrated weight (called the "Calibration Weight") attached to the wheel centering adapter are measured as an output voltage from each pick-up. These voltages are measured with a calibrated weight threaded into the centering adapter at an exact known distance and diameter from each pick-up. The voltages are also measured without the calibrated weight. During "Readout Adjustment" (C 8 3 C) step 5, the voltage output from the pick-ups without the calibrated weight and during step 6 the voltages from the pick-ups with the calibrated weight are measured and memorized by the computer. This information is stored on a EEPROM located on the Interface circuit board.

Completing operator calibration requires two operations, one with and one without the calibration weight attached to the wheel adapter similar to following steps 5 & 6 of the "Readout Adjustment". The computer compares the voltages with those stored during the "Readout Adjustment". When necessary the computer adjusts the readouts to match the original "Readout Adjustment" accuracy.

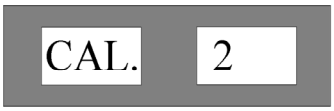
Operator Calibration procedure:

Without a wheel on the balancer remove the cones, ringnut and pressure cup from the adapter. Leave only the threaded shaft and faceplate attached to the balancer shaft. A calibration weight will be found threaded into the rear wall of the balancer chassis.

1. Enter C 1 4 C.
2. Press Start.



3. Thread the calibration weight into the wheel adapter backing plate.
4. Press Start.



At the completion of calibration the machine will stop and emit three beeps.

Operator Calibration is completed. Remove the calibration weight and return it to the rear of the balancer.

SUBJECT: Trouble Shooting the Electric Control Boards

Although the electric boards for the above mentioned machines have proven to be very reliable and trouble free, most of the components can be easily exchanged should trouble occur. For this reason, we strongly suggest that every possible attempt be made to repair these boards on site, by substitution of components. The only circumstance in which a board change should be required, is if the transformer, ribbon cable, or relay diodes are defective.

Each technician should be sure to have all interchangeable components in stock. These, when used in conjunction with the attached trouble shooting guide, should allow almost any electric board repair to be carried out on site.

Recommended parts for inventory:

Part #	Quantity	Description
# 1001036/1	5	Fuse 8.0 A, 250 volts
# 1001035/1	5	Fuse 0.8 A, 250 volts
# 1001036/3	5	Fuse 12.0 A, 250 volts
# 1001035/2	5	Fuse 0.4 A, 250 volts
# 3440068	4	Relay, 24 volt coil
# 3762010/1	1	Capacitor 56-67 MFD, 250 VAC Motor Start type
# 3762010/4	1	Capacitor 43-52 MFD, 330 VAC Motor Start type
# 4481432	1	Capacitor 45 MFD, 330 VAC Motor Run type
# 3762010/5	1	Capacitor 50 MFD, 330 VAC Motor Run type
# 3300050	1	Rectifier, 15 A.

Testing of individual components on electric board.

CAUTION! DISCONNECT MACHINE FROM POWER SOURCE BEFORE PERFORMING ANY OF THE FOLLOWING TESTS.

1. Transformer

1. To test transformer resistance, remove fuse F2 from electric board. Set your multimeter to ohms, and select appropriate scale.

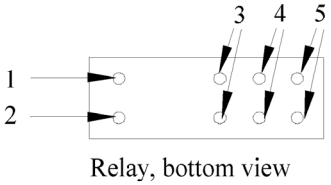
   A: Transformer primary resistance.
   - Place meter leads on L2 terminal and load side of fuse F2.
   - Resistance should be approximately 22 - 26 ohms.

   B: Transformer secondary resistance.
   - Remove ribbon cable leads #12 and #11 from the interface board.
   - Place meter leads across these wires, #12 and #11.
   - Resistance should be approximately 0.8 - 1.4 ohms.

2. To test output voltage of the transformer, install fuse F2, set meter to Vac, and select the appropriate range. Leaving ribbon cable leads #12 and #11 disconnected from the interface board, place meter leads across the wires and turn on machine.
   - Voltage should be approximately 19 - 26 vac.

2. Relays.

To test the relays, remove them from the board and set meter to ohms. Measure across the terminals indicated below.



Relay, bottom view

A: Coil resistance, measured across terminal #1 & #2
- should be approximately 1000 ohms.

B: Normally closed contacts, measured across terminal #3 & #4
- should be approximately 0 ohms.

C: Normally open contacts, measured across terminal #4 & #5
- should be an open circuit

3. Start Capacitor

To test the start capacitor, remove the black leads at the capacitor. Set the meter to ohms, low to middle scale. Touch the meter leads across the terminals of the capacitor. The resistance should jump towards zero, then gradually increase. Now reverse the meter leads and the meter should do the same again. This test can give an indication that the capacitor is defective by telling if it is open or shorted. It cannot tell if the capacitor is the proper capacitance value. A capacitor tester or the following procedure should be used.

$$\text{MFD} = \frac{2650 \times \text{Measured Current}}{\text{Measured Line Voltage}}$$

(At the capacitor)
MFD= The Capacitor Value.

Testing of individual components on electric board.
(cont.)

Example: For this example a Geodyna 80 115 Volts machine was used. The capacitor on the electric board is a 56 - 67 MFD cap. The measured line voltage is 122 Volts, and the measured current at the capacitor is 3 Amps.

2650 X 3 (A) ÷ 122 (V) = 65 MFD

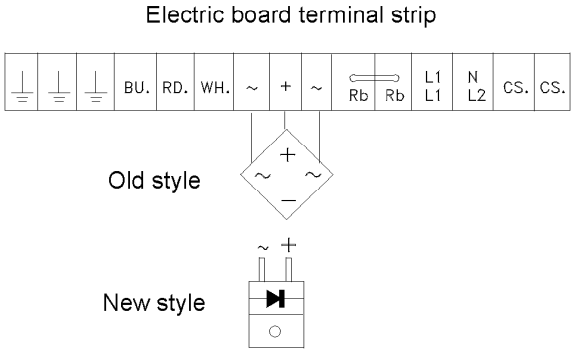
4. Ribbon Cable

To test the continuity of the ribbon cable, disconnect the cable from the interface board. Set the meter to ohms, and measure across the indicated wires in both directions. The meter should read the indicated value in at least one direction. Leave in the relays for this test.

Wires #12 & #11 ~ 0.8 - 1.4 ohms	Wires # 6 & # 5 ~ 1000 ohms
Wires #10 & # 9 ~ 1000 ohms	Wires # 13 & # 5 ~ 1000 ohms
Wires # 8 & # 7 ~ 1000 ohms	

5. Brake Rectifier (Positioning).

1. To test brake rectifier, remove rectifier diode (or bridge) from the electric board. Set meter to ohms, (or diode test if meter is so equipped). Measure across the terminals of the device as indicated below, observing polarity.



A: With meter leads as follows,
Red to "~", Black to "+"
Reading = 500 - 700 ohms

Red to "+", Black to "~"
Reading = open circuit

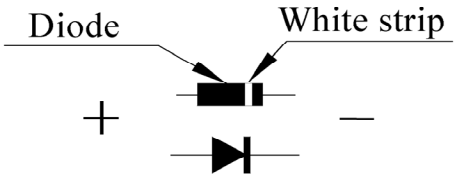
Red to "~" , Black to "~"
Reading = open circuit

2. When installing new 2 lead rectifier diode for older 3 lead style, use the two left-most terminals only.

Testing of individual components on electric board.
(cont.)

6. Relay Diodes

To test the relay diodes mounted on the board, set meter to ohms, (or diode test if meter is so equipped). With the relays removed, measure across the device as indicated below, observing the polarity.



Red to "+", Black to "-"
Reading = 500 - 600 ohms

Black to "+", Red to "-"
Reading = open circuit

NOTE: A properly functioning diode will show low resistance in one direction only

7. Motor

To test the motor, disconnect the motor leads from the electric. Set the meter to ohms and measure as indicated below. For this test, polarity does not matter.

Blue to white wire, 4 - 8 ohms
Red to white wire, 4 - 8 ohms
Any color to green, open circuit

NOTE: All of these values should fluctuate if motor shaft is turned while measuring with meter

Electric Board Trouble Shooting Table

Symptom	Diagnostic Test / Check		Probable Fault
Machine does not have a display.	Is there voltage at the output of the transformer?	NO	-Fuse is blown. -Defective transformer. -Defective ribbon cable; (leads #11 & #12).
		YES	-Fuse on processor board is blown. -Processor board is defective
E74 Wheel will not spin.	Press “start” then spin wheel by hand. Does wheel continue to spin?	NO	-Fuse F1 is blown; -Check motor. -Defective relay K1M. -Defective ribbon cable; (leads #9 & #10). -Defective motor (red to white).
		YES	-Defective relay K3M. -Defective capacitor. -Defective ribbon cable; (leads #5 & #6). -Defective motor (blue to white).
E31 Wheel will spin backwards.	Press “start”, Does wheel continue to Spin backwards after E31?	NO	-Defective capacitor.
		YES	-Defective relay K2M.
No brake.	Normal start but no brake at end of cycle.		-Defective relay K2M. -Defective ribbon cable; (leads #7 & #8).
Machine “hums” when turned on.			-Defective relay K1M. -Defective relay K2M. -Or Processor circuit board.
Machine is running louder than normal.	Is “start” capacitor abnormally hot?	NO	-Check mechanics of drive system (belt tension, pulleys etc.)
		YES	-Defective relay K3M.
No Position brake.			-Fuse F3 is blown, check rectifier. -Defective brake rectifier. -Defective relay K4M. -Defective resistor 230 volts, HP machine only.

Program Updates: Eprom Versions

Version 1.2 Date: 1/93 Geodyna 40 only

Version 1.3 Date: 3/94 Models Geodyna 60, 80 added
Code C47C will display these modes: Geodyna 40, 60, 80, 95

Version 1.4 Date: 7/94 Software Improvements only, no new features.

Version 1.5 Date: 12/95 Software Improvements

Version 1.51 Date: 1/96

Model Geodyna 80.E added
Code C47C will display these modes: Geodyna 40, 60, 80, 80.E
Automatic entry of standard wheel dimensions upon switching machine on:

6" for ⟷, 14" for ↕, 7.0 cm for →
Codes 17, 18, 19 where added.
C17C Selects number of revolutions for a measuring run. The number selected cannot be stored in the permanent memory.
C18C Increases the measured rim width.
C19C Decreases the measured rim width.

To adjust make sure each code is set to zero. Enter C 18 C press 0, then press the C button. Enter C 19 C press 0, then press the C button.

Measure a rim if the measured width is lower than the actual width use code C18C, if the measured width is higher than actual width use code C19C.

Enter C 18 C. Enter the offset value required to allow proper rim width measurement. To correct, the offset value must be entered in millimeters (mm) then press the C button. (1.0 inch = 25 mm)

Enter C 19 C. Enter the offset value required to allow proper rim width measurement. To correct, the offset value must be entered in millimeters (mm) then press the C button. (1.0 inch = 25 mm)

Now these adjustments must be stored in the permanent memory by using the code C10C.

Program Updates: Eprom Versions cont.

Version 1.52 Date: 2/96

Code C17C the number selected now can be stored in the permanent memory using C10C.
Codes C18, C19 the operation was changed.
C18C now corrects for rim diameter measurements.
C19C now corrects for rim width measurements.
Correction value for C18, C19 is now entered in inches.

Version 1.53 Date: 3/96

When using Codes C18, C19 the value displayed in the left hand display can be reset by pressing their respective diameter & width buttons.

Version 1.60 Date 1/98

Model Geodyna 40 Limited Edition (GEO 40.P) has been added
Codes C0C, C46C, have been deleted
Code C15C has been added. It is a LED light show
0 = disabled
1 = on after 5 minutes of non-use
2 = test (always on)

Codes C18C & C19C cannot be accessed when in Geodyna 40 & 60 modes
Code C19C cannot be accessed when in Geodyna 40.P & 80

Code C47C now displays 40, 60, 80, 80.E, 40.P
It was changed so that when entered it automatically sets up the following codes to these default values.

C1C = 0	C11C = 1 (N/A for Geo 40)
C2C = 1	C13C = 0
C3C = 1	C15C = 1
C5C = 1	C17C = 10
C8C = 3.50	C24C = 1
C9C = 0.25	C80C = 160 (Geo 40 & 60 only)

There is a .8 second delay before machine will start when pressing the start button or by lowering the wheel guard.

A / B Operator was added. Pressing # button will toggle between operator A & B wheel dimensions.

Program Updates: Eprom Versions cont.

Version 1.61 Date 5/98

Code C83C will not accept a value of 85 grams or less in step 2.

The .8 second delay before the machine starts was changed to .5 seconds.

Code C20C was added. This code adjusts the imbalance location. It can only be accessed by unplugging the opto electronic unit. When C47C is entered it will be automatically set to the default value of 20.

Code C24C was changed. Now it can only be accessed by unplugging the opto electronic cable from the interface board.

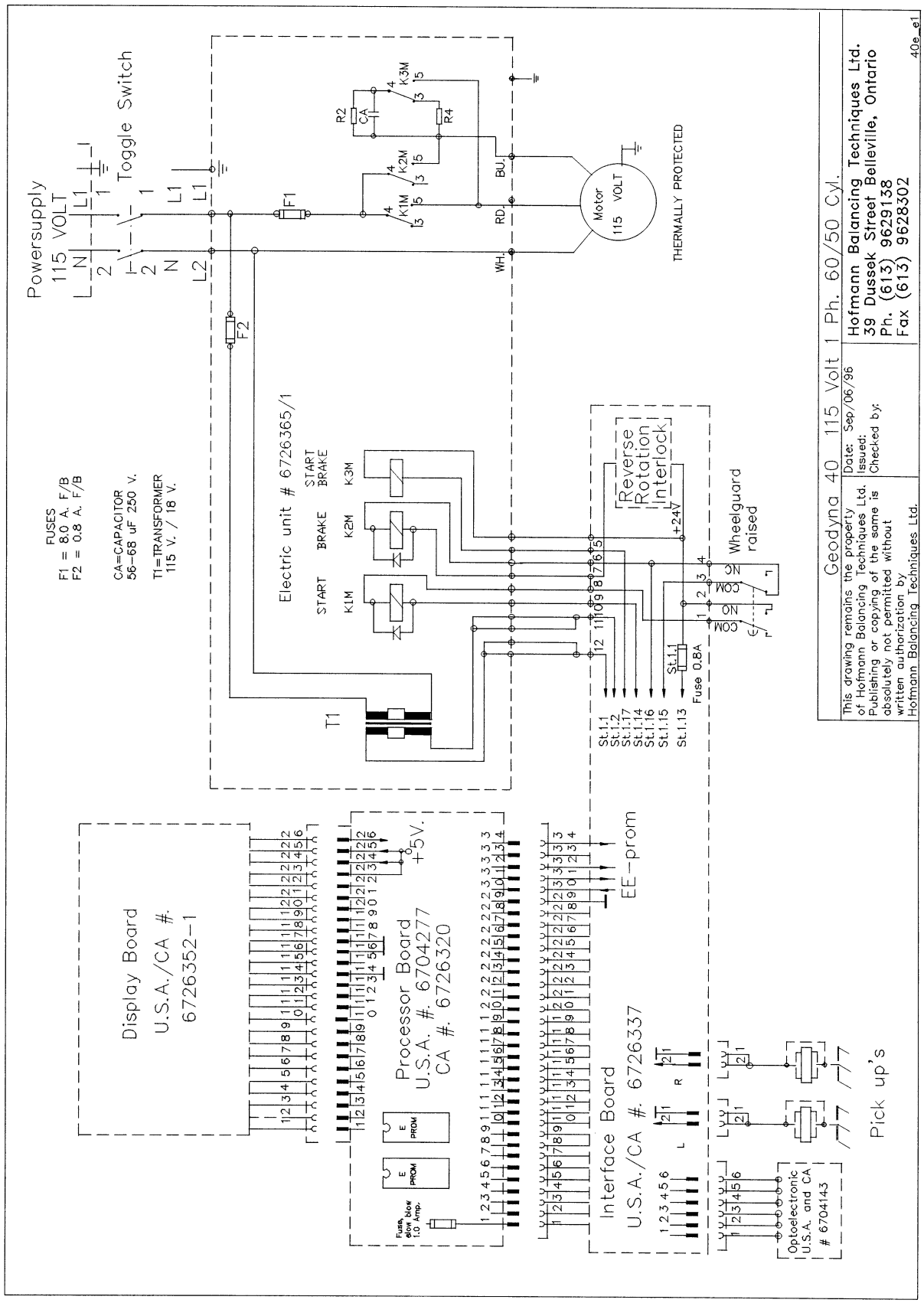
Error codes E3 & E4 now cannot appear in models 40 & 60. Error code E4 now cannot appear in models 80 & 40.P

Error code E54 now will not appear until C55C is below 16 volts.
It was 23 volts, in previous versions.

When replacing this version with versions 1.2 - 1.52 the machine will have to be completely re-adjusted.

When replacing this version with versions 1.53 or 1.60 the only codes that will have to be set are C47C & C20C.

Notes:


Powersupply
115 VOLT
Toggle Switch
FUSES
F1 = 8.0 A. F/B
F2 = 0.8 A. F/B
CA=CAPACITOR
56-68 uF 250 v.
T1=TRANSFORMER
115 V. / 18 V.
Electric unit # 6726365/1
START
BRAKE
K1M
K2M
K3M
R2
CA
R4
Motor
115 VOLT
THERMALLY PROTECTED
Reverse Rotation Interlock
+24V
Wheelguard raised
Fuse 0.8A
St.1.1
St.1.2
St.1.17
St.1.14
St.1.16
St.1.15
St.1.13
T1
Display Board
U.S.A./CA #.
6726352-1
Processor Board
U.S.A. #. 6704277
CA #. 6726320
+5V.
EE-prom
Interface Board
U.S.A./CA #. 6726337
Optoelectronic
U.S.A. and CA
6704143
Pick up's
Geodyna 40 115 Volt 1 Ph. 60/50 Cyl.
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Date: Sep/06/96
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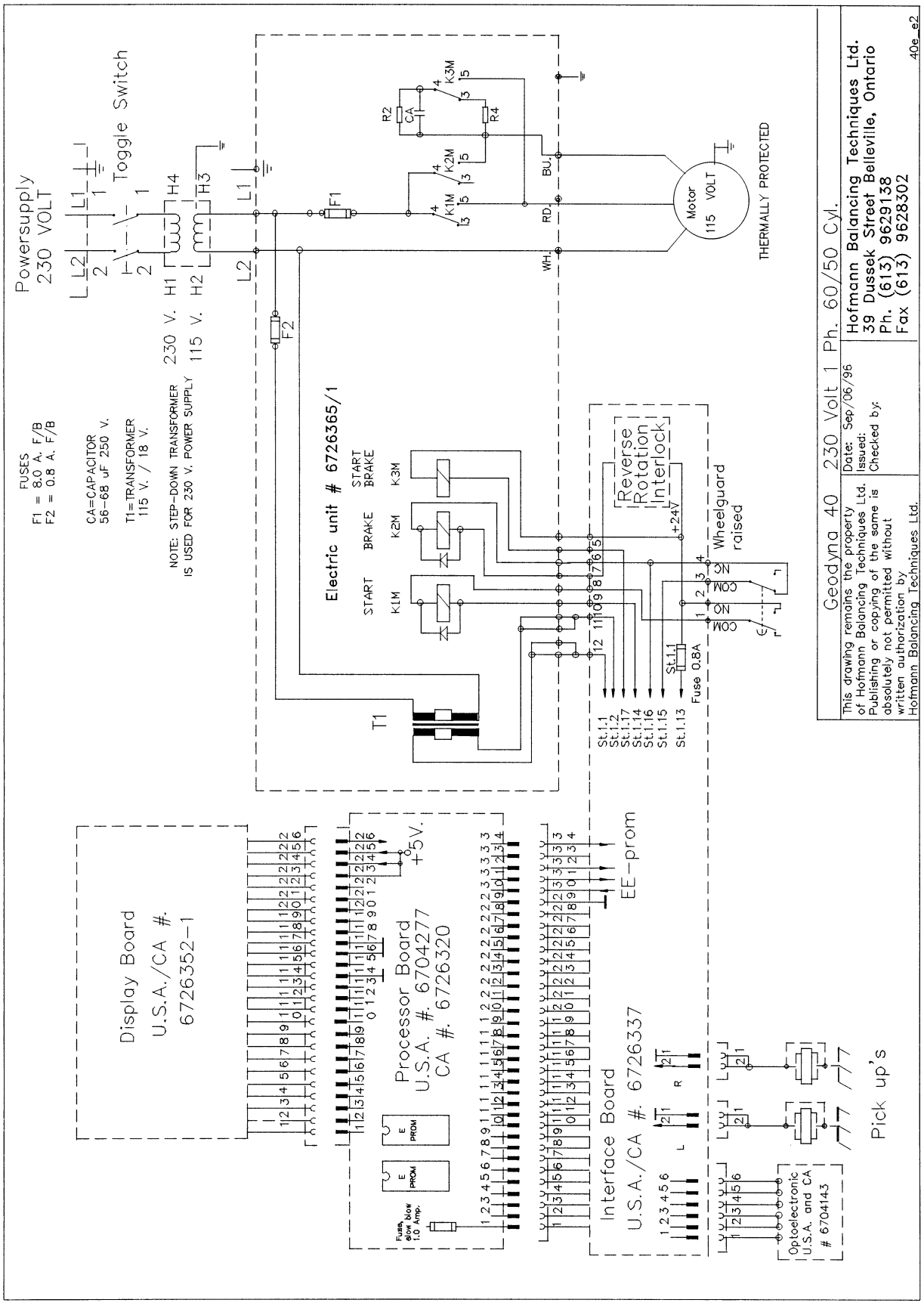
Hofmann Balancing Techniques Ltd.
39 Dussek Street Belleville, Ontario
Ph. (613) 9629138
Fax (613) 9628302
40e_e1


Powersupply
230 VOLT
FUSES
F1 = 8.0 A. F/B
F2 = 0.8 A. F/B
CA=CAPACITOR
56-68 uF 250 V.
T1=TRANSFORMER
115 V. / 18 V.
NOTE: STEP-DOWN TRANSFORMER
IS USED FOR 230 V. POWER SUPPLY
230 V. H1
115 V. H2
H4
H3
Toggle Switch
L1
L2
F1
F2
Electric unit # 6726365/1
START
BRAKE
K1M
K2M
K3M
T1
R2
CA
R4
K1M
K2M
K3M
BU.
RD.
WH.
Motor
115 VOLT
THERMALLY PROTECTED
+24V
Reverse
Rotation
Interlock
Wheelguard
raised
NC
COM
NO
St.1.1
Fuse 0.8A
St.1.1
St.1.2
St.1.17
St.1.14
St.1.16
St.1.15
St.1.13
Display Board
U.S.A./CA #.
6726352-1
Processor Board
U.S.A. #. 6704277
CA #. 6726320
+5V.
E PROM
Fuse, slow blow
1.0 Amp.
Interface Board
U.S.A./CA #. 6726337
EE-prom
R
L
Optoelectronic
U.S.A. and CA
6704143
Pick up's
Geodyna 40 230 Volt 1 Ph. 60/50 Cyl.
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Date: Sep/06/96
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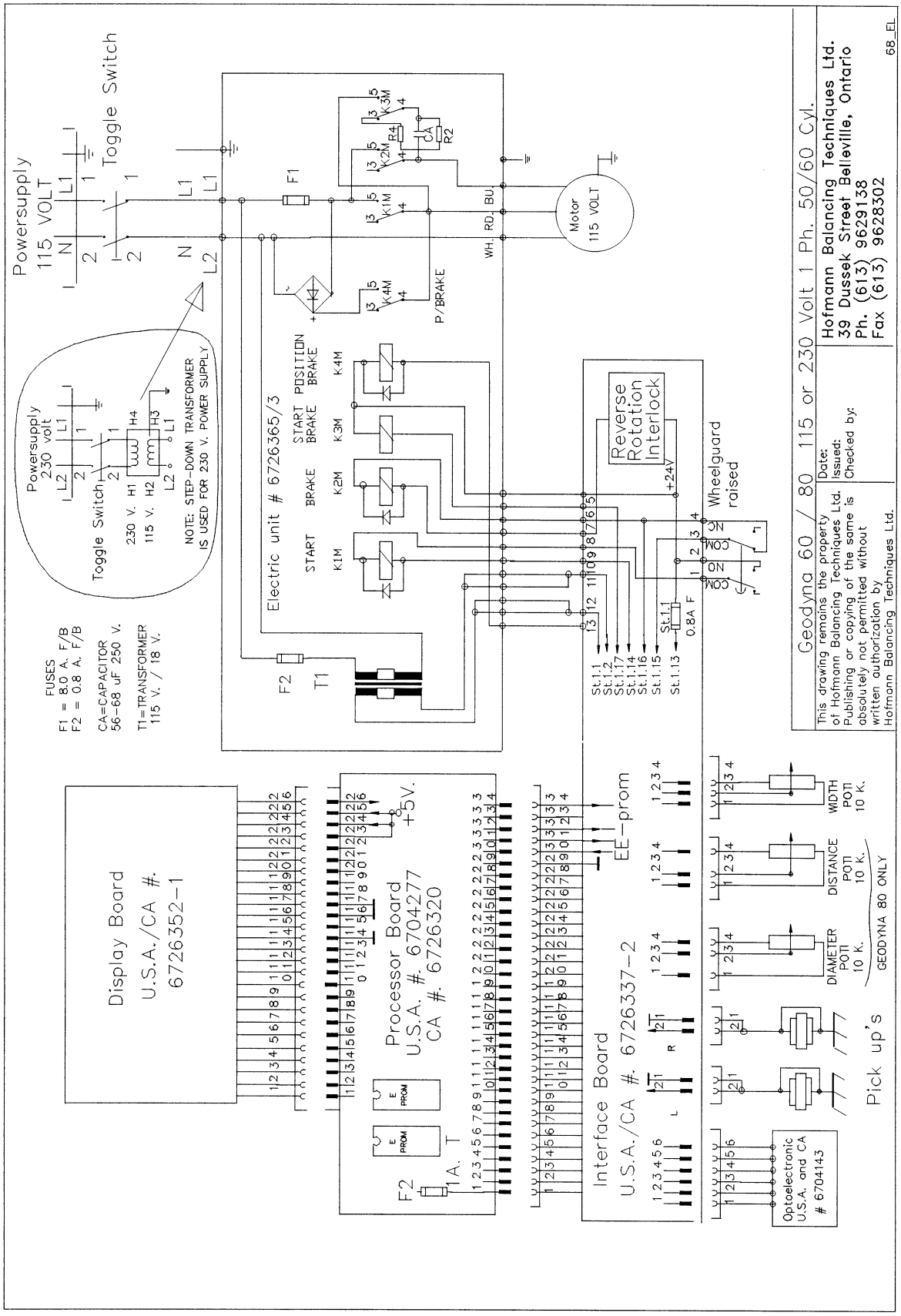
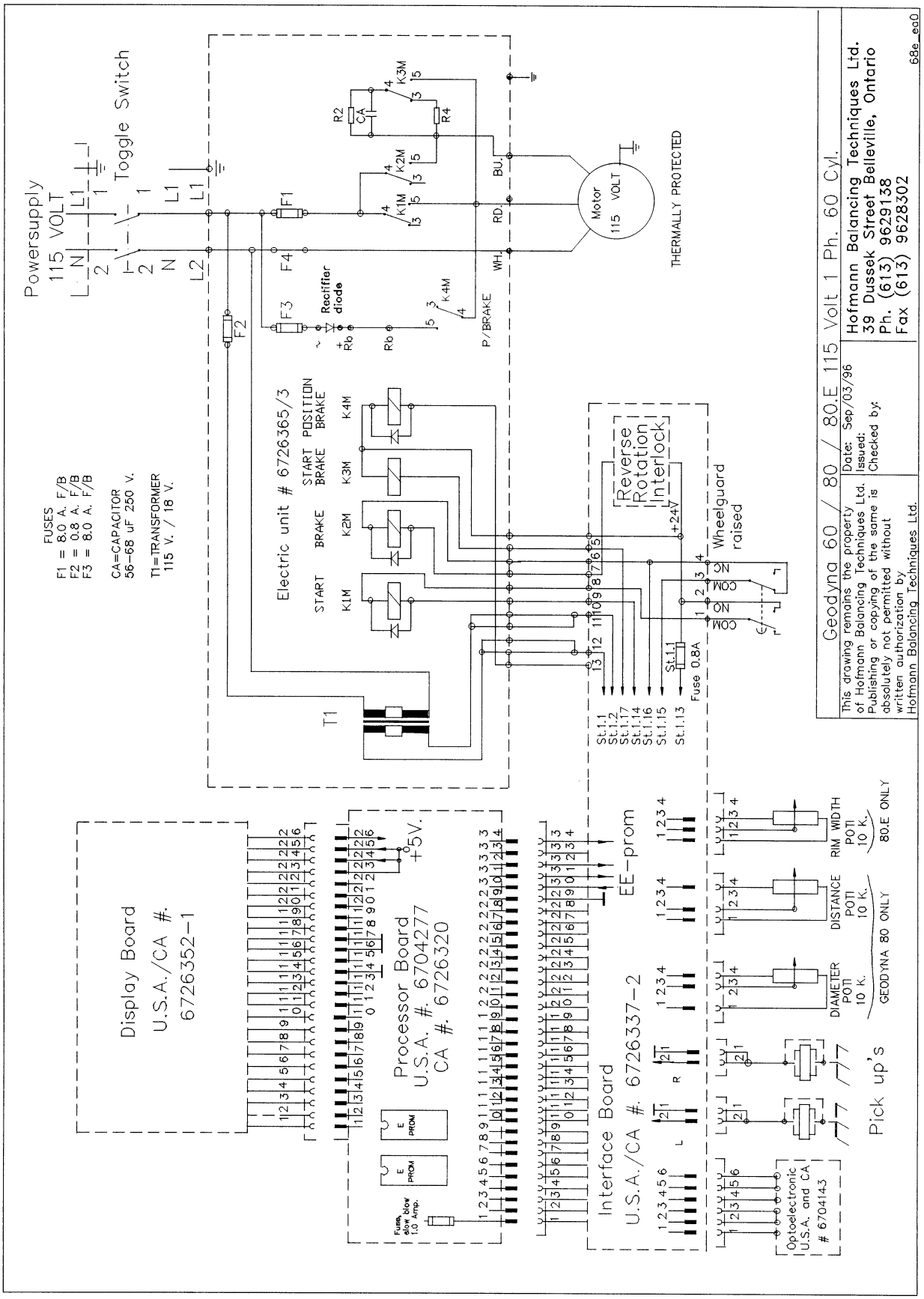
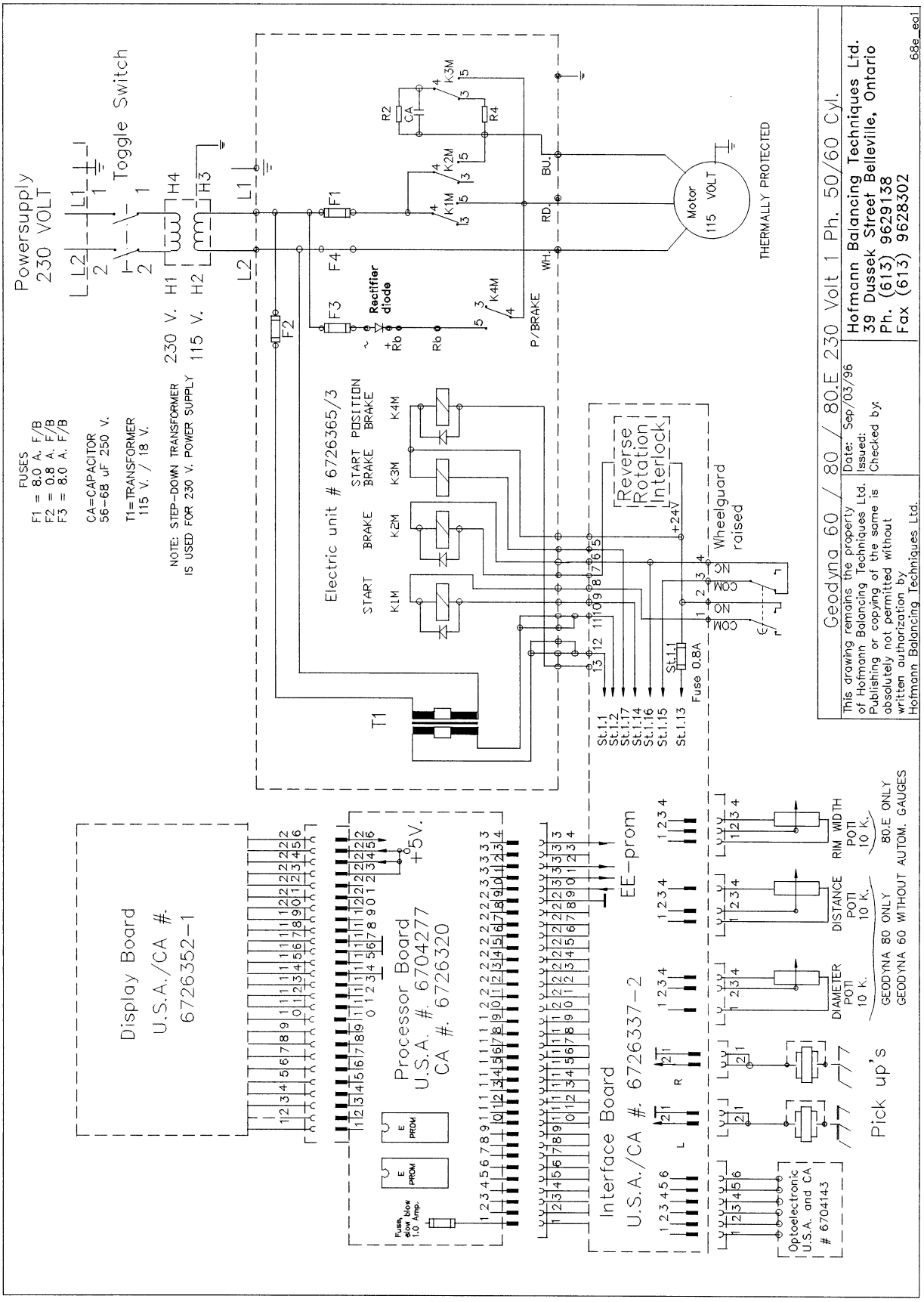
Fax (613) 9628302
40e_e2

Geodyna 60/80 115 or 230 Volt diagram using F1 & F2 fuses



Geodyna 60/80 115 Volt diagram using F1, F2, F3 fuses




Powersupply
230 VOLT
Toggle Switch
FUSES
F1 = 8.0 A. F/B
F2 = 0.8 A. F/B
F3 = 8.0 A. F/B
CA=CAPACITOR
56-68 uF 250 V.
T1=TRANSFORMER
115 V. / 18 V.
NOTE: STEP-DOWN TRANSFORMER IS USED FOR 230 V. POWER SUPPLY
230 V. H1 H2
115 V. H2
Electric unit # 6726365/3
START BRAKE
K1M K2M K3M K4M
START POSITION BRAKE BRAKE
Rectifier diode
P/BRAKE
Motor 115 VOLT
THERMALLY PROTECTED
Reverse Rotation Interlock
Wheelguard raised
Fuse 0.8A
Display Board
U.S.A./CA #.
6726352-1
Processor Board
U.S.A. #. 6704277
CA #. 6726320
+5V.
Interface Board
U.S.A./CA #. 6726337-2
EE-prom
DIAMETER POTI 10 K.
DISTANCE POTI 10 K.
RIM WIDTH POTI 10 K.
80.E ONLY
GEODYNA 80 ONLY
GEODYNA 60 WITHOUT AUTOM. GAUGES
Pick up's
Optoelectronic U.S.A. and CA # 6704143
Geodyna 60 / 80 / 80.E 230 Volt 1 Ph. 50/60 Cyl.
Date: Sep/03/96
Issued:
Checked by:
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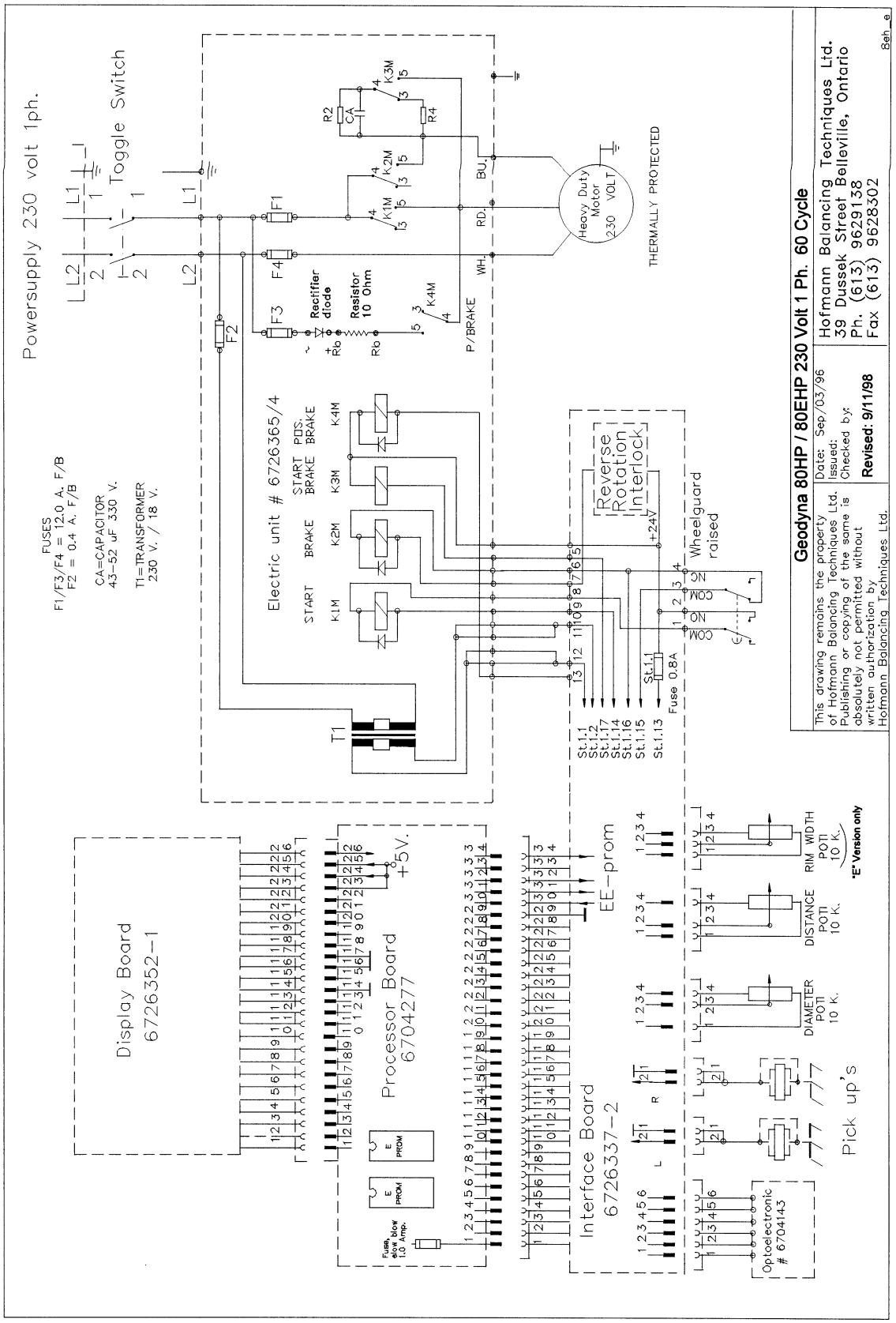
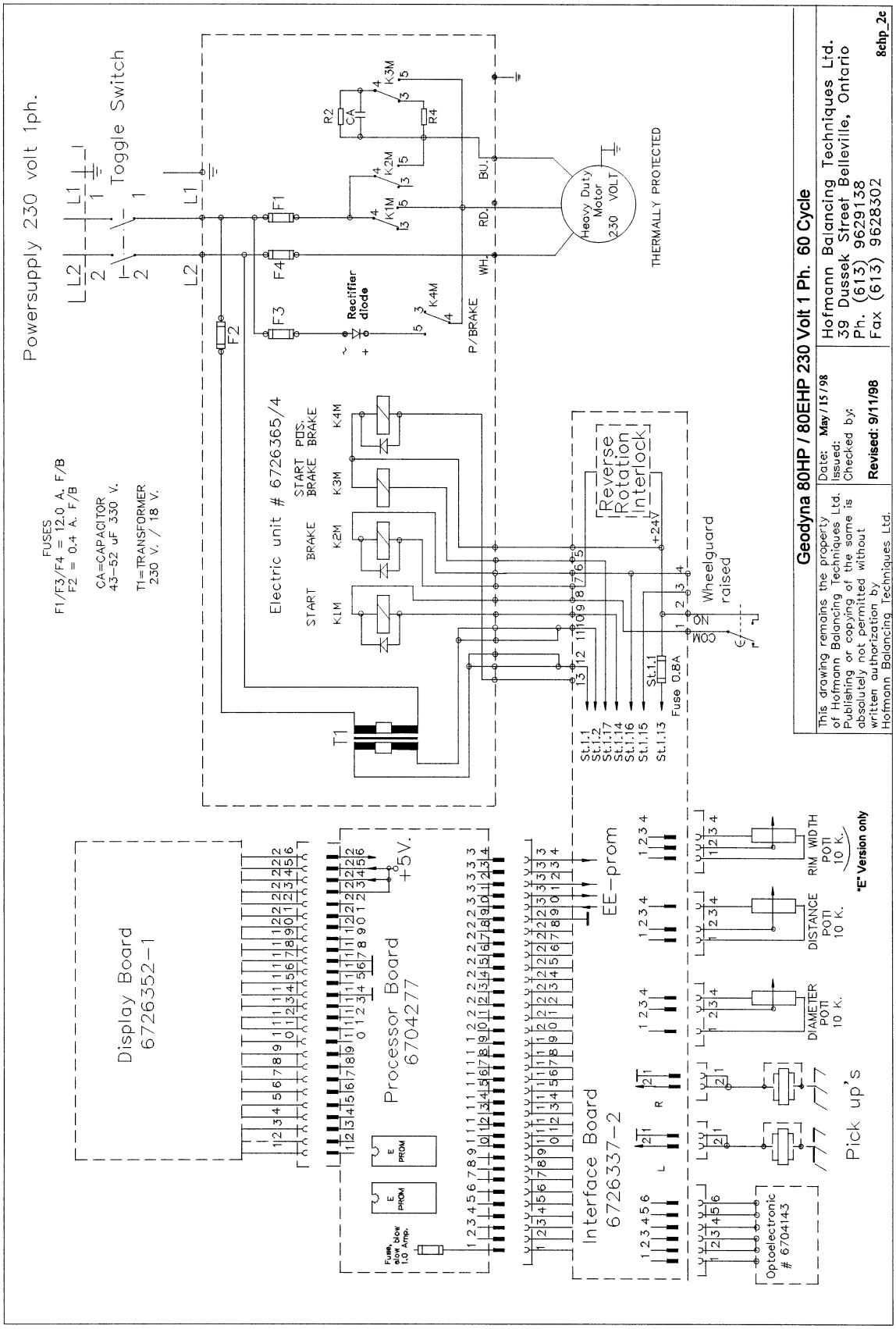
Hofmann Balancing Techniques Ltd.
39 Dussek Street Belleville, Ontario
Ph. (613) 9629138
Fax (613) 9628302
68e_ea1


Powersupply 230 volt 1ph.
Toggle Switch
Electric unit # 6726365/4
Rectifier diode
Resistor 10 Ohm
Heavy Duty Motor 230 VOLT
THERMALLY PROTECTED
Reverse Rotation Interlock
Wheelguard raised
Display Board 6726352-1
Processor Board 6704277
Interface Board 6726337-2
EE-prom
Pick up's
DIAMETER POTI 10 K.
DISTANCE POTI 10 K.
RIM WIDTH POTI 10 K.
"E" Version only
Optoelectronic # 6704143
Geodyna 80HP / 80EHP 230 Volt 1 Ph. 60 Cycle
Hofmann Balancing Techniques Ltd.
39 Dussek Street Belleville, Ontario
Ph. (613) 9629138
Fax (613) 9628302
Revised: 9/11/98


Powersupply 230 volt 1ph.
Toggle Switch
FUSES
F1/F3/F4 = 12.0 A. F/B
F2 = 0.4 A. F/B
CA=CAPACITOR
43-52 uF 330 V.
T1=TRANSFORMER
230 V. / 18 V.
Electric unit # 6726365/4
START BRAKE
PDS. BRAKE
Rectifier diode
P/BRAKE
Heavy Duty Motor 230 VOLT
THERMALLY PROTECTED
Reverse Rotation Interlock
Wheelguard raised
Fuse 0.8A
Display Board 6726352-1
Processor Board 6704277
Interface Board 6726337-2
EE-prom
DIAMETER POTI 10 K.
DISTANCE POTI 10 K.
RIM WIDTH POTI 10 K.
"E" Version only
Pick up's
Optoelectronic # 6704143
Geodyna 80HP / 80EHP 230 Volt 1 Ph. 60 Cycle
Date: May/15/98
Issued:
Checked by:
Revised: 9/11/98
Hofmann Balancing Techniques Ltd.
39 Dussek Street Belleville, Ontario
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8chp_2e
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